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## NOTES ON THE ANATOMY OF OREOHELIX. II.

BY HENRY A. PILSBRY.

The following notes supplement those contained in these PROCEEDINGS for 1916, pp. 340-359. With one exception they deal with material collected by Professor Junius Henderson and Mr. L. E. Daniels in Utah and Idaho, in 1916. A single species taken by Mr. Ferriss in southern Nevada is also included.

*Oreohelix haydeni* and subspecies. Fig. 1.

The typical form has not been rediscovered, but it is not likely to differ materially in genitalia from the numerous forms of the species already dissected. The several subspecies are much alike in soft anatomy; the chief differentiation has been in the shells. The researches of Messrs. Henderson and Daniels in 1916 have added materially to our resources, particularly in northeastern Utah.

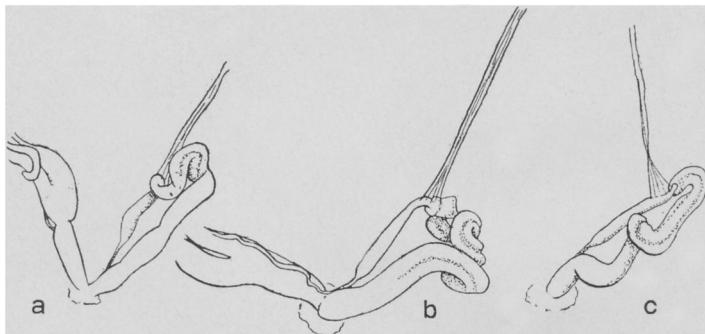


Fig. 1.—a, *Oreohelix haydeni hybrida*, St. Charles, Idaho; c, Devil's Slide, Utah, Station 54; b, *O. h. mixta*, Glenwood Springs, Colo., Station 134.

As the printer transposed several columns of my former table of measurements,<sup>1</sup> the entire series of measurements of genitalia is given below. This replaces the table given in 1916.

As *O. h. oquirrhensis* form *utahensis* Hemph. was very inadequately defined, and no type seems to have been selected, I name No. 23,051 A. N. S. P., as lectotype, in order to have a definite standard. This specimen was described in *Nautilus*, XXIX, p. 141, April, 1916.

<sup>1</sup> PROC. A. N. S. PHILA., 1916, p. 347.

SUBSPECIES AND LOCALITIES.	Length of penis.						Collecting stations, etc.	
	Length of internally costate part of penis.	Length of epiphallus.	Penial retractor muscle.	Length of vagina.	Length of spermatheca and duct.	Approximate diameter of shell.		
<i>O. h. gabriana</i> , Oquirrh Mts.....	16	6	5.5	11	5.5	20	Station 15.	
<i>O. h. corrugata</i> .....	16.5	5	5	7	5	17	18	Station 40.
<i>O. h. hybrida</i> , near Logan Canyon.....	16	4	4	5	5	15	19	Station 42.
St. Charles, Idaho.....	12	5.3	4.7	4	.....	13	Station 77.	
	10	4	4	.....	.....	.....	Station 77.	
Deweyville, Utah.....	16	6	5	9.5	.....	16	Station 104.	
Devil's Slide, Utah.....	15	6.5	5.3	9.3	.....	18	Station 54.	
<i>O. h. "utahensis,"</i> Devil's Slide.....	12	5	4	.....	.....	17	Station 51.	
<i>O. h. mixta</i> , Glenwood Springs, Colo....	15.5	5	5.3	10	.....	15	Station 134.	
	17	5.5	5.5	5.	.....	16	Station 134.	
Type.....	18	6.8	6.3	18	9	18.3	94058 A. N. S.	
	17.5	7.7	6	8	6	18	94796 A. N. S.	
<i>O. h. betheli</i> .....	19	6	7.5	18+	5	21	22.5 94059 A. N. S.	

NOTE.—In the last three entries the diameter of shell is from the specimens dissected. In other cases it is from a medium specimen of lot. The collecting stations mentioned are those of Henderson and Daniels' expedition of 1916.

**Oreohelix peripherica** (Anc.). Fig. 3b.

A view is given of the penis of a white specimen from Station 47, Morgan, Utah. Length of penis 13 mm., of ribbed portion 5, of epiphallus 4.5, of penial retractor 12 mm. (fig. 3b).

*O. p. wasatchensis* (Hemph.) from Station 108 shows the same proportions, though the absolute size is greater. Length of penis 20 mm., of internally ribbed part 8, of epiphallus 7, of penial retractor 15 mm. A specimen from Station 109 is identical in genitalia.

**Oreohelix strigosa depressa** (Ckll.).

An example of the rather elevated form of the color-form *carnea* from City Creek Canyon, Salt Lake City, is similar to those already

figured in genitalia. Length of penis 27 mm., of internally ribbed part 11, of epiphallus 7 mm. The distal part has a trilobed section.

***Oreohelix cooperi* (W. G. B.).**

Specimens dissected from four localities give the following measurements of the male organs:

	Sta. 68, near Montpelier, Idaho.	Sta. 69, near Montpelier, Idaho.	Sta. 73, Paris, Idaho.	Sta. 83, near Garden City, Utah.
Length of penis.....	12.3	11	17	12 mm.
L. internally ribbed part of penis.....	6.5	6.3	10	7 "
L. epiphallus.....	4.6	6	6	4 "
L. retractor penis.....	14	.....	.....	10 "
Diam. of shell (approximate).....	19	14	25	17 "

As noted in a previous paper, this species is constantly distinguishable from *O. peripherica* and the several forms of *strigosa* and *haydeni* by having the internally ribbed part of the penis longer than the papillose part; but *O. rugosa* has the same proportions of the penis, and can be distinguished from *O. cooperi* only by shell characters, which are not very definite.

***Oreohelix hendersoni dakani* Henderson. Fig. 2.**

Specimens from the type locality, Newcastle, Colo., were dissected. The genitalia are similar to *hendersoni*, and unlike *O. rugosa*, which

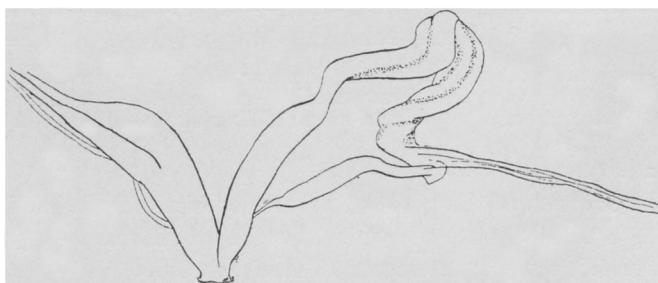


Fig. 2.—*Oreohelix hendersoni dakani*, genitalia.

resembles *O. cooperi* closely in soft anatomy. The distal part of the penis of *dakani* has a trilobed transverse section.

- Length of penis, 21 mm.; of ribbed lower part 7.3 mm.
- Length of epiphallus, 6.3 mm.
- Length of retractor p., 14 mm.
- Length of vagina, 6 mm.

**Oreohelix tenuistriata** Hend. and Dan. Fig. 3a.

Topotypes dissected show that this is a species having genitalia like *haydeni* and *strigosa depressa*. The length of penis is equal to the diameter of the shell; the length of its internally ribbed lower portion is contained  $2\frac{1}{2}$  times in the total length.

Length of penis, 10 mm.; of its internally ribbed portion  
4 mm.  
Length of epiphallus, 2 mm.  
Length of retractor p., 6.5 mm.  
Length of vagina, 3 mm.

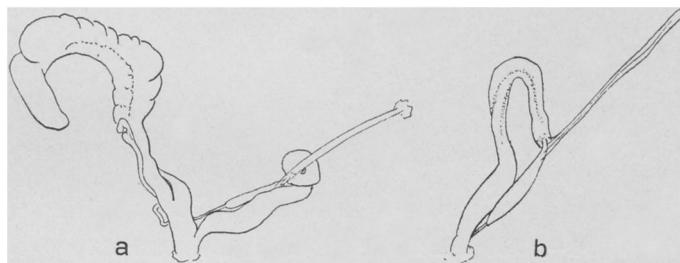


Fig. 3.—a, *Oreohelix tenuistriata*. b, *O. peripherica*, Morgan, Utah.

The central and lateral teeth have sharp side cutting points, the marginals with distinct cusps. There are about 6 lateral teeth; but the transition to marginals is very gradual. Jaw is striate, light yellow.

*O. hemphilli* and *O. carinifera*, which approach *tenuistriata* in characters of the shell, are unfortunately not known anatomically, but the forms nearest *hemphilli* have genitalia like *O. yavapai*.

**Oreohelix hemphilli eurekensis** Hend. and Dan. Fig. 4a.

Topotypes dissected. It groups with *O. yavapai*, having the internally ribbed part of the penis more than half the total length, the latter less than the diameter of the shell. We do not know the genitalia of typical *O. hemphilli*, but assuming that it is like *eurekensis*, both should be transferred to the group containing *O. yavapai*, *concentrata*, *metcalfei*, *pilsbryi* and *barbata*.

Length of penis, 4.4 mm.; of ribbed portion 2.5 mm.  
Length of epiphallus, 2 mm.  
Length of retractor p., 6 mm.

There are distinct side cutting points on the central and two or three lateral teeth, after which there are distinct side cusps. There are about 7 lateral teeth. Transition to marginals very gradual.

*Oreohelix handi* Pilbry and Ferriss. Fig. 4b.

One of the original lot collected by Mr. Ferriss on Charleston Mountain in southern Nevada was dissected. The penis is 3 mm. long, epiphallus 1.3 mm. The internally thickened part of the penis is about half the total length and much swollen. It is closely related to *O. yavapai* and *O. hemphilli eurekensis*.

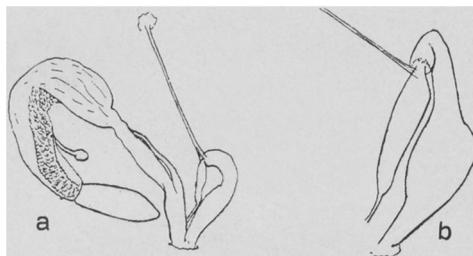


Fig. 4.—a, *Oreohelix hemphilli eurekensis*. b, *O. handi*.